

10/568395

10

IAP20 Rec'd PCT/PTO 13 FEB 2006

CLAIMS

- 5
- 10
- 15
- 20
- 25
- 30
- 35
1. Portable communication device (10) comprising:
an antenna arrangement for sending and receiving radio traffic comprising
a first flat antenna element (18) located within and extending through a
major portion of the device, and
a second smaller antenna element (20) in the form of an elongated body
stretching essentially along a side of the first antenna element and being
connected to the first antenna element at a first end of said side of the first
antenna element thereby providing a gap (d) between the first and second
antenna elements, the length of which is essentially defined by the length of
the side of the first antenna element and the length of the second antenna
element,
a radio circuit (22) for feeding antenna elements connected between the first
and second antenna element between the first and a second end of said side of
the first antenna element, and
at least one further antenna (30) for a separate type of communication,
preferably a positioning antenna for receiving position information for instance
via satellite, and provided on a section of the antenna arrangement making
small contributions to the antenna currents in the antenna arrangement.
 2. Portable communication device according to claim 1, wherein the first antenna
element extends along most of the width of the device.
 3. Device according to claim 1 or 2, wherein the first antenna element has a flat
shape, preferably provided in a layer of the main circuit board of the device.
 4. Portable communication device according to any previous claim, wherein the
further antenna is placed orthogonally to the first antenna element so that the
antenna currents of the further antenna are orthogonal to the antenna currents
on at least the first antenna element.
 5. Portable communication device according to claim 4, wherein the further
antenna is placed on the first antenna element at an end thereof furthest from
the second antenna element.
 6. Portable communication device according to claim 4, wherein the further
antenna is placed on the second antenna element.

7. Portable communication device according to claim 6, wherein the further antenna is placed on a part of the second antenna element that is perpendicular to the first antenna element.
- 5 8. Portable communication device according to claim 6 or 7, wherein the second antenna element serves as ground plane for the component.
9. Portable communication device according to any of claims 1 - 3, wherein the further antenna is placed on the second antenna element.
- 10 10. Device according to claim 9, wherein the first antenna element is provided in a layer of the main circuit board of the device and the leads to the component are provided in another layer and provided to the component via the connection between the first and second antenna elements.
- 15 11. Device according to any previous claim, wherein the radio circuit includes at least one tuning network for tuning the antenna to one or more frequency bands.
- 20 12. Device according to any previous claim, in which it is a cellular phone.